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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/054,962	01/25/2002	Chun-Lien Su	4006-150	8798

7590 06/24/2003

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EXAMINER	
CHEN, KIN CHAN	
ART UNIT	PAPER NUMBER
1765	2

DATE MAILED: 06/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/054,962	SU ET AL.	
	Examin r	Art Unit	
	Kin-Chan Chen	1765	

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 9, the preamble states the purpose of the process is to control and monitor the thickness variation of a film structure. However, it is unclear how the thickness variation of a film structure is controlled in the process steps.

Claim Rejections - 35 USC § 103

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilbert et al. (US 5,885,856; hereinafter "Gilbert").

In a method of improving the planarization and equilibrating the polishing rate of the surface of a semiconductor wafer (so-called controlling and monitoring the thickness variation of a film structure of a semiconductor wafer in the instant claims), Gilbert teaches that the semiconductor wafer may include at least one device region and a dummy region (so-called testing region in the instant claims). The device region and the testing region may have the same film structure. The CMP may be applied (col. 2, lines 13-25).

Gilbert teaches that the layout of patterns that are used to define the various structures of integrated circuit are generally computer generated and the proper size and location of dummy structure are also determined (col. 4, lines 1-18). Hence, it would have been obvious to one with ordinary skilled in the art to that the so-called first pattern density of the film structure is calculated.

Gilbert also teaches the film structure of the testing region is etched that a second pattern density of the film structure of the testing region being substantially compatible with the first pattern density of the device region (col. 5, lines 35-63; col. 2, lines 41-60). Gilbert teaches performing CMP process to polish and form a planar surface level. Therefore, it would have been obvious to one with ordinary skilled in the art that the thickness variation of the film structure including device region and test region) are monitored and controlled in order to provide a planar surface level.

As to dependent claims 2-3, it would have been obvious to one with ordinary skilled in the art to adjust the ratio of first pattern density to the second pattern density because it is merely a matter of choice of design depending on the specific product layout so as to form a planar surface level after polishing.

3. Claims 5-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilbert et al. (US 5,885,856; hereinafter "Gilbert") as applied to claim 1 above, and further in view of Huang et al. (US 5,895,254; hereinafter "Huang").

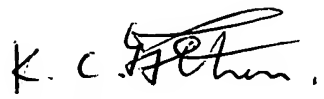
The discussion of modified Gilbert from above is repeated here.

The claimed invention differs from Gilbert by specifying conventional method for forming shallow trench isolation. Huang is only relied on to show conventional method for forming shallow trench isolation. Huang teaches depositing first dielectric layer, depositing second dielectric layer, partially removing the second dielectric layer on the device region and cover the shallow trenches. Silicon nitride may be used as stop layer in a CMP process (claims 7 and 14). CVD may be sued to form a silicon oxide as the second dielectric layer (claims 8 and 15). Hence, it would have been obvious to one with ordinary skilled in the art to use the method of Huang in the process of Gilbert in order to provide their art recognized advantages and produce an expected result.

As to dependent claims 10 and 11, it would have been obvious to one with ordinary skilled in the art to adjust the ratio of first pattern density to the second pattern density because t is merely a matter of choice of design depending on the specific product layout so as to form a planar surface level after polishing.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (703) 305-0222. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin Utech can be reached on (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. Any inquiry of a general nature or relating to the status of this

application or proceeding should be directed to the receptionist whose telephone number is (703) 308-2934.



Kin-Chan Chen
Primary Examiner
Art Unit 1765

June 23, 2003